

REMARKS

The Office Action dated July 9, 2003 has been carefully reviewed and the foregoing remarks are made in response thereto. In view of the above claim amendments and following remarks, Applicants respectfully request reconsideration and reexamination of this application and timely allowance of the pending claims.

By this Amendment, claims 1-5 have been canceled and new claims 10-31 have been substituted therefor. Applicants respectfully submit that substitute claims fall within the subject matter of the elected invention and that no new prohibited matter has been introduced by the substitute claims. While written description support for the substitute claims can be found throughout the specification, examples of specific support for the additional claims can be found in the original claims and specification as set forth in the table below.

Claim	Support in Specification and Original Claims
10, 28-29	page 1, lines 15-19; page 4, lines 1-4; page 5, lines 12-16, page 16, lines 18-28
11-13, 19-20	page 4, lines 1-4
14-15, 21-22	page 4, lines 23-24
16, 23	page 5, lines 6-10; claim 1
17, 24	page 6, lines 11-20
18-27	page 12, lines 1 to page 16, line 28 (protein isolation in Examples 2-3)
30-31	page 7, lines 26-31

Summary of the Office Action

1. Claims 1-5 were rejected under 35 U.S.C. 112 (second paragraph) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.
2. Claims 1-5 were rejected under 35 U.S.C. 112 (first paragraph) as failing to comply with the written description requirement.
3. Claim 1 was rejected under 35 U.S.C. 112 (first paragraph) because the specification does not reasonably provide enablement for anti-freeze proteins having as little as 80 percent overlap with SEQ ID NO: 1 which inhibit ice recrystallization activity.

Rejection based on 35 U.S.C. 112 (second paragraph)

Claims 1-5 were rejected under 35 U.S.C. 112 (second paragraph) for purportedly being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. Applicants have cancelled these claims, therefore the rejection is moot. Applicants submit that the substitute claims do not contain the language (*i.e.*, “overlap”) that formed the basis of the rejection of the cancelled claims.

Rejections based on 35 U.S.C. 112 (first paragraph)

Claims 1-5 were rejected under 35 U.S.C. 112 (first paragraph) for purportedly failing to comply with the written description requirement. The Office Action indicates that the claims purportedly do not provide sufficient written description for anti-freeze proteins having eighty percent sequence identity at the N-terminous with SEQ ID NO: 1. Without acquiescing to the merit of the rejection, Applicants have cancelled these claims, therefore the rejection is moot. Applicants submit that the specification provides sufficient written description for an isolated protein with an isoelectric point less than 4.5, an apparent molecular weight of about 24 kDa, at least 90 percent amino acid sequence identity at the N-terminous with SEQ ID NO: 1, which displays substantial ice recrystallization inhibitory activity as set forth in the substitute claims. These claims, in addition to now providing for 90 percent sequence identity at the N-terminous, also recite the physical properties of the isolated protein (*i.e.*, an isoelectric point less than 4.5 and a molecular weight of about 24 kDa). Applicants therefore submit that the claimed isolated protein with the recited physical properties is adequately supported by the specification (see, for example, page 16, lines 18 to 20 where three separate proteins are isolated with these same physical properties).

Claim 1 was rejected under 35 U.S.C. 112 (first paragraph) as purportedly not being enabled for antifreeze proteins with 80 percent sequence identity at the N-terminous to SEQ ID NO: 1. Without acquiescing in the merits of the rejection, Applicants have cancelled claim 1, therefore the rejection is moot. As discussed above, the substitute claims now provide the feature that the claimed protein have at least 90 percent sequence identity at the N-terminous to SEQ ID NO: 1. The recited level of sequence identity (90 percent) provides for a maximum of two substitutions in SEQ ID NO: 1.

While the Office Action purports that substitution of a single amino acid results in complete loss of activity (see Office Action at page 7, first paragraph), it fails to recognize that identification of a single amino acid residue that would eliminate all activity of a protein is an exception to the general rule that one or two conservative substitutions generally do not affect the activity of a protein. Furthermore, the

specification discloses N-terminal sequences of the claimed protein with conservative amino acid substitutions (e.g., SEQ ID NO: 2) that still retain at least 90 percent sequence identity to SEQ ID NO: 1 and the recited physical properties in the substitute claims.

Conclusion

The foregoing remarks are being made to place the application in condition for allowance. Applicants respectfully request reconsideration and timely allowance of the pending claims. A favorable action is awaited. Should the Examiner find that an interview would be helpful to further prosecution of this application, she is invited to telephone the undersigned at his convenience.

If there are any fees due in connection with the filing of this amendment, please charge the fees to our Deposit Account No. 50-310. If a fee is required for an extension of time under 37 C.F.R. 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Except for issue fees payable under 37 C.F.R. 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0310. This paragraph is intended to be a **constructive petition for extension of time** in accordance with 37 C.F.R. 1.136(a)(3).

Dated: **October 9, 2003**
Morgan, Lewis & Bockius LLP
Customer No. **09629**
1111 Pennsylvania Ave., N.W.
Washington, D.C. 20004
202-739-3000

Respectfully submitted
Morgan, Lewis & Bockius LLP



Robert Smyth
Registration No. 50,801